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CURRICULUM I:1
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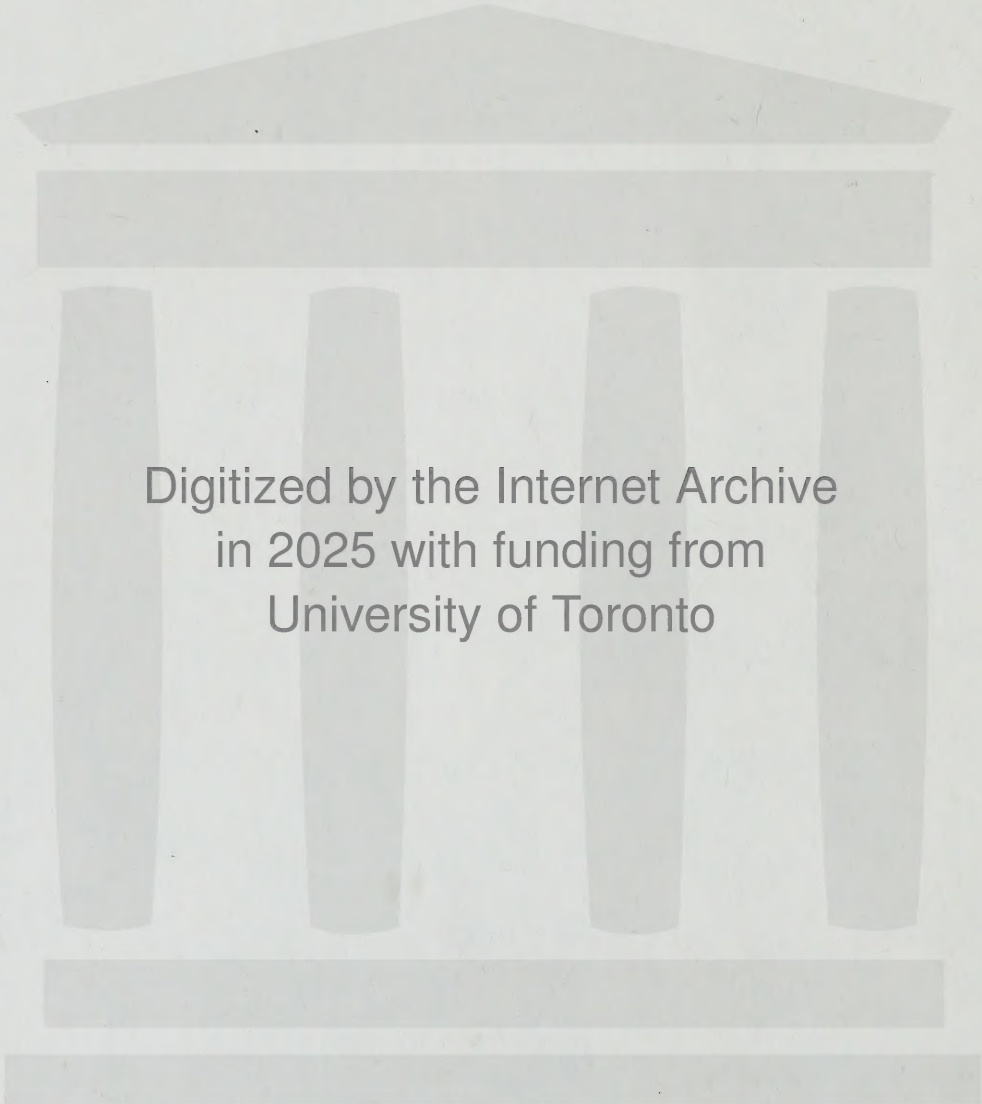
COURSES OF STUDY

REPRINTED WITHOUT CHANGE

FROM CURRICULUM I:1

for

1. ART, GRADES 7, 8, 9, and 10
2. ENGLISH, GRADES 7 and 8
3. MATHEMATICS, GRADES 7, 8, 9, and 10



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ENGLISH

English is vital to the general development of the pupils and is, therefore, the direct concern of every teacher. Adequate skill in the use of English is essential to progress in all subjects of the curriculum, in meeting the practical demands of everyday life, and in fulfilling the duties of citizenship in a democracy. To use English well is a valuable accomplishment; to use it inadequately is to be judged as fundamentally uneducated. To make its contribution to the development of the pupils, the teaching of English should be stimulating, systematic, and thorough.

Through the study of English, pupils are helped to comprehend meaning readily and fully, to think clearly, and to communicate ideas effectively. Practice in listening and reading attentively will help pupils to follow a line of thought, to gather ideas, and to widen their experience. Practice in writing and speaking clearly increases the pupils' powers of thinking, for the step towards clarity of expression is a step towards clarity of thought. Thus the effort of the pupils to grasp the precise significance of words and to express themselves sincerely, accurately, and agreeably is a potent influence upon their personal growth. Practice in communication with others challenges pupils to have something worthwhile to say, and to judge their success in saying it convincingly by the reaction of their audience. This challenge develops the habit of self-criticism and stimulates further effort to convey meaning effectively.

English literature is a heritage of excellence in many forms. Studied in a manner appropriate to the level of the pupils' attainment it encourages them to be more exact in their thinking, more mature in their emotional response, and more discerning in their attitude to life. The study of many different kinds of writing aids pupils to acquire a lasting and discriminating interest in reading. This is of the utmost importance. It adds to the pupils' stock of general knowledge, thus enabling them to form personal opinions upon a variety of subjects. It helps them to discover and pursue special interests. It widens their opportunities for enjoyment and provides a means of lifelong self-education.

PRINCIPLES AND PRACTICES

Individual Differences

Since the courses outlined for the Intermediate Division are suited to the normal capacity and experience of pupils at the average age level in each grade, the needs of more talented or less gifted pupils require special attention. Teachers, therefore, must adjust their instruction to provide for individual needs and differences so that each pupil will be challenged to proceed at the rate of which he is capable. To do this, teachers must take into account different personalities, with widely divergent backgrounds and home conditions, and different attitudes towards school training. Thus in smaller schools several levels of instruction must be carried on in the same class. In larger schools there may be grouping and re-grouping of pupils according to their progress.

Individual Assessment

At the beginning of the school year and at frequent intervals thereafter, the teacher should study and assess the attainments and capacities of individual pupils. The variations in these will increase in successive grades. Pupils who seem to possess almost identical powers in early grades frequently reveal a wide disparity in subsequent years.

Selection, Emphasis, Continuity

In dealing with the different topics of the course of study, it is necessary to keep in mind the importance of selection, emphasis, and continuity. The teacher should not neglect any section of the course, but select and emphasize those parts of each which are most closely related to the pupils' needs and interests.

Local Adaptation

The course of study offers a general plan for adaptation to local conditions. Thus, a community with a large proportion of new Canadians will present language problems and provide resources different from those in other communities.

Forgetting

In attempting to reach a reasonable level of achievement in each grade, the teacher should make allowance for the fact that pupils are prone to forget principles and practices already taught but not thoroughly assimilated. Repetition and review can remedy the lapses of youthful memory.

Teacher Direction

The teacher must be adept in recognizing the most suitable time and opportunity for offering direction to the pupils, neither overestimating nor underestimating their powers of judgment. Assistance is most beneficial when the pupils' efforts have been fully utilized.

Pupils' Interests

Pupils in the Intermediate Division are at a stage in their development when they have many interests. These they hold loyally, often vehemently, even if only for a short time. The teacher can capitalize upon these interests and use them effectively in English activities. But what of the pupils who have few interests, who seem never to have anything to say or anything to write about? These pupils need to be helped and encouraged. Easy reading material, visits to places of interest, class discussions, topics from other subjects, school activities, personal and vicarious experiences will help them to make their contribution. A topic such as "My First Ride in a Plane" calls for simple, sincere expression of thought and feeling about a natural personal experience, whereas "The Aviation Industry in Canada" is a topic so broad as to evoke generalities expressed in language unnatural for an adolescent.

Correction

Regular direction and constructive criticism of written work is necessary. Personal guidance which leads the pupil to improve his own work is of inestimable value. Much effective work can be done by the teacher who moves about among the pupils offering helpful suggestions. Sometimes a good paragraph by one of the members of the class may be written on the blackboard and its merits and defects discussed freely with advantage to all. The teacher's part in such discussions should be only directive. An excellent practice under proper conditions is to encourage the pupils to work in groups for mutual help and criticism.

In all written work credit should be given for the pupils' honest efforts, and defects in the mechanics of expression should not be allowed to obscure merit in the thought and feeling.

Genuine creative ability may be found in only a few pupils of these grades, but creative writing, in the sense that it is inventive, imaginative, and fresh, is fairly common and deserves encouragement and kindly guidance.

Models

Literary models, carefully chosen to suit the age and understanding of the pupils, are useful in stimulating personal creative effort, not mechanical imitation. Frequent use of good models from the pupils' own work can be of special value in encouraging better writing and motivating self-criticism.

Objectives in the Study of Literature

The main objectives in the study of literature are the cultivation of a taste for good reading, the enlargement of experience, the stimulation of the imagination, the enrichment of knowledge, and the development of character. The pupil develops a richer and fuller personality by association with great minds and through wholesome vicarious experiences. An imagination stirred by Kipling's art in the pages of "Captains Courageous" will be less likely to respond to the cheap sensations of the crime thriller. But teachers should avoid fulsome praise of classic writers. Let the author speak eloquently for himself.

The teacher should recognize that it is of primary importance that the pupils enjoy the material which they read. The pupils should not be expected, therefore, to appreciate the merits of literature which is beyond their powers of understanding, nor should the teacher impose adult standards of literary judgment in his direction of the pupils' reading.

Extensive Study

In the Intermediate Division the treatment of literature should be largely extensive. The intelligent and sympathetic reading of a selection should be followed by group discussion stimulated and directed by challenging questions. The primary aim of this group study is the enjoyment and understanding of good literature, the sharing of emotional response, and the growth of discrimination and good taste. Pupils should be led to feel that their opinions are interesting and worthwhile, and that mutual constructive criticism of one another's opinions is a desirable and natural thing.

Levels of Language

Pupils should be led to recognize that language varies in different circumstances and for different purposes. Language has social significance; it is governed by the rules of good taste as well as good usage. Thus, the language of the ball game is one form of appropriate English, whereas the language of the class discussion is another.

The Teacher of English

The teacher is the pupils' model of good posture and grooming, clear speech, sound judgment, and gracious manners. He should be aware of his constant influence upon the interests, tastes, and personalities of his pupils. The measure of his success in the teaching of English will be the interest of the pupils in good books, their powers of straight thinking, and their ability to speak and write clearly, naturally and sincerely, to read intelligently, and to appreciate the good things of life which are revealed to us through language.

Outline of the Course

This outline has been prepared for the use of Curriculum Committees in drawing up courses of study for the Intermediate Division. It follows closely the outline for Grade VII printed in Curriculum I:1 (1950) which, as was stated therein, also provided a sound guide for courses in Grades VIII, IX, and X. The main headings of the previous Grade VII outline have been retained in the present outline for the entire Intermediate Division. In the outline of work under these main headings, additional sub-headings have been included to indicate more advanced work for Grades VIII, IX, and X, and statements have been inserted to assist Curriculum Committees in distributing the work among the four grades of the Intermediate Division.

The conception that grade levels are rigid and correspond to equally rigid levels of progress in all branches of the work in English is unrealistic and should be discouraged among teachers. In each part of the work in every grade of the Intermediate Division there are some pupils who need instruction at a lower grade level and others who need more advanced work. Therefore, teachers must adjust their instruction to meet the special needs of these groups so that each pupil will be challenged to progress at his best rate.

Comprehension

1. Reading skills
   (a) Practice when necessary to increase ability in
       - getting the main thought
       - following the sequence of ideas or events
       - recalling details
       - making inferences
       - following directions
       - locating information -- use of table contents, index, etc.
       - finding answers to questions by skimming
       - appraising content, examining a book to estimate its usefulness in terms of the topic under study
       - testing an opinion

The teacher's first duty when meeting a new class is to discover the individual attainments of his pupils in reading. The teacher may secure assistance in checking his appraisal of the pupils' needs by using standardized reading tests. Necessary practice, beginning slightly below the achievement level, should then be provided. Serious deficiencies require careful diagnosis followed by well-considered prescription and frequent practice.

Since the pupil's success in any subject on the course of study depends largely upon his reading skill, all teachers should give attention to the special reading problems connected with their special subjects. The teacher of English should give extensive practice in the various types of reading -- recreational, informative, reflective, and practical -- in other subjects as well as in English literature to ensure that the pupils can apply their reading skills to a wide variety of problems and subject matter.

(b) Types of reading

"In the best schools, reading has ceased to be a lesson and has become a pursuit." (Ballard)

- Recreational
- Informational
  - current events
  - conservation
  - special interests
  - widening horizons
- Reflective
  - discovering others' opinions
  - understanding problems
  - making critical judgments
- Practical
  - following directions
  - discovering specific information
  - exploring new ideas
  - assisting in planning
- Report
  - locating material for classroom use in discussions, summaries, reports, etc.
- Reference
  - securing and correlating different kinds of information

2. Library skills

Purposeful practice in real situations in all subjects, including

- recalling how to open a new book, how to turn a page
- practising alphabetical arrangement
- using table of contents
- using indexes in texts and references
- understanding arrangement of encyclopaedias used by the pupils
- using the dictionary for
  - quick location
  - interpretation of pronunciation (syllables, accents, diacritical marks)
  - grammatical use
  - derivation
  - meaning
- making outlines or summaries
  - use of topical headings
  - key words
  - selection of quotations, stating sources
  - logical arrangement
  - elaboration from the outline for oral and written reports

using illustrations, charts, maps, diagrams
organization, arrangement, and management by the pupils of a classroom library of
available references in all subjects
recreational reading
pupils' own books lent to the classroom library

An atmosphere of interest in good books and wholesome reading should be established in the English classroom and in the school library by the provision of attractive library facilities, including adequate shelving and a wide variety of reading with emphasis on interesting books of adventure and noble deeds. Generous use of tackboards for the resourceful display of illustrative material, which is topically appropriate and frequently changed, will stimulate interest in events, places, and people as well as in the topics currently being studied in other subjects. Instruction in library practice should be given to the extent necessary for proper use of reference material in all subjects. Pupils will welcome and benefit from sharing in the management of the classroom or school library. Teachers should make good use of the facilities of the travelling library and should cooperate with and encourage the use of the community library. But neither of these agencies can take the place of a well-stocked school library containing the sort of reading which young people like and from which they can derive most benefit. The library is the pulsing heart of the school which gives life and interest to the work in every subject.

3. Study habits
(a) Environment
undisturbed
quiet
with ready access to materials
healthful: light, heat, posture

(b) Clearness of purpose
objective in mind
determination of means to this end
concentrated effort for short periods

(c) Regular classroom demonstrations and practices in supervised study-periods of the techniques applicable to such activities as:
collecting and collating information from two or three sources,
e.g., What stage furniture and properties should be used for a scene laid in a Norman castle of the 14th century?
writing a report, e.g., A Visit to an Industrial Plant
making a summary from which to give an oral report,
e.g., The Life History of an Insect
memorizing effectively
how to memorize
facts of common knowledge
salient facts for oral reports
quotations from prose or verse
reading for background, e.g., What can we find out about buffalo which will prepare us to enjoy "The Buffalo Hunt"?
making memoranda during or after a lecture or a reading

As his share of the guidance programme, the teacher of English should accept responsibility for assisting the pupils to observe closely, to select information, and to organize it for a definite purpose. The development of good study habits is accelerated when the pupils have a genuine interest in the subject and are convinced of the value of mastering it.

4. Word study
   Enlargement of vocabulary through
   (a) Savouring and using choice words or expressions as they appear
   (b) Spelling, using lists of similarly spelled words which introduce new words, e.g., interior, exterior, inferior, superior
   (c) Using prefixes, suffixes, and roots, explained as they appear
   (d) Using the dictionary
       taught as a skill
           regular practice as the occasions arise
           (Variant spellings found in any standard dictionary are acceptable)
   (e) Studying words with a background
           as the words occur
           some separate study
               words derived from people and places, e.g., derrick, damask, bayonet, miller, boycott
               words derived from mythology, e.g., vulcanize, atlas, jovial, January
               naturalized foreigners, e.g., potato, sofa
               mutton, matinee
   (f) Synonyms, antonyms, homonyms

5. Listening with a purpose
   Class exercises to
   (a) Get the meaning by
           selecting the main ideas
           relating these to experience
           using context clues
   (b) Get the mood from
           inflexion and tone
           expression
           gesture
   (c) Overcome handicaps by
           eye attention
           concentration
   (d) Emphasize the obligations of an audience
           good manners, in public and school assemblies
           attention
           appreciation of effort, sincerity, excellence
           judgment
               weighing arguments
               reserving judgment
               asking pertinent questions

Training pupils in the neglected art of listening is important. This can be done by setting pupils the objective of understanding a selection and judging its merits from hearing it read aloud by the teacher or a fellow pupil. Questions and discussion based on the selection will encourage them to listen attentively, critically, and with enjoyment.

Appreciation

The appreciation of good English literature is an element in the study of English which cannot be definitely prescribed or evaluated for the different levels of school experience. It is developed gradually by evolution and refinement and can hardly be measured by the usual yardsticks.

Pupils who are entering the Intermediate Division may be expected to show some evidences of appreciation by their response to the different books which they read and study. We cannot expect them to present critical estimates of their reading either in oral or in written form at this stage. But, as they proceed from Grade VII to Grade X, we can gradually present to them more and more of the elements of form, content, and expression which combine to produce a work of literary art. As they gain more maturity, we can question them more searchingly regarding the qualities of composition which contribute to the excellence of fine literature. But even in Grade X we must not expect pupils to discuss literary style with any mature judgment. We should be satisfied if they are able to comment sincerely and thoughtfully upon the interest of content and upon some of the more obvious qualities of form and expression.

1. Extensive reading, including that of the Approved Readers, for
   - enjoyment
   - information
   - appreciation
   - developing free reading

Extensive reading, both oral and silent, if wisely and sympathetically conducted, should provide a sound foundation for interesting and valuable free reading which will grow in scope and depth as the pupil proceeds through the Intermediate Division, and which should continue to develop throughout the subsequent life of the reader.

2. Intensive study of appropriate selections, mastering content for
   - enjoyment
   - information
   - judging reliability
     - sincerity
     - usefulness
     - relation to life
   - recognizing merit of form
     - clearness
     - conciseness
     - force
     - order
     - pattern

beauty of rhythm
sound
imagery
expression
diction
responding to mood and feeling

Personal experiences through reading are the ultimate objectives of all study of English literature. All the literature chosen for study should, therefore, have intrinsic meaning for the pupils at their age and experience level. If it deals with subjects entirely foreign to their lives and experiences and far beyond the scope of their youthful imaginations, it can have no true worth for them. The author's sensory and social experiences, his flights of fancy, his thoughts, and his feelings must all be shared in a very real sense by his readers. Selections for intensive study must, therefore, be sufficiently broad and flexible to suit not only the general grade levels but also the mental capacities, the social situations, and the individual personalities and interests of pupils within each grade.

It is natural that the choice of material will be influenced by the limitations of the pupils' interests and capacities. On the other hand selections of fine literature which require skilful presentation and thoughtful questioning by the teacher should not be excluded. These can do much to improve understanding and appreciation. Some selections at least should induce even the most capable and intelligent pupils to reach above their present levels in order to grow in taste, appreciation, and understanding.

Because of the variety and diversity of material required for the study of literature throughout the Intermediate Division, it is manifestly impossible to designate definite selections as applicable to only one grade. But, as pupils proceed through the Intermediate Division, an increasingly intensive study of suitable literary selections should be possible in keeping with their growing capacities.

Pupils in these grades may be expected to improve their powers of discrimination as they progress. They should become increasingly capable of distinguishing fine literature from shoddy writing, honesty from prejudice, clearness from obscurity, order from confusion, beauty from ugliness, and sincerity from pretence. Throughout the Intermediate Division it should be the aim of the teacher to help the pupils to recognize the value of plain, clear, orderly expression; accurate and picturesque words; pattern, variety, and rhythm of sentences; effective development in paragraphs; unity, coherence, and emphasis; the artistic use of colour, music, imitative harmony, comparison, contrast, simple imagery; and the basic metres and rhyme schemes of English poetry.

3. Encouraging appreciation by free reading based on the interests of the pupils

exposing pupils to many attractive books
introducing time-tested favourites of this age-group
new books of merit within the pupils' capacity
reading by the teacher, especially of passages which the pupils might not otherwise appreciate

Perhaps the greatest service which the teacher of English can offer his pupils is the encouragement of wholesome reading habits. It is the duty of the teacher not only to interest pupils in reading but also to provide access to attractive reading material, old and new, which is at once within the pupils' grasp, stimulating in nature, and of good quality. Above all, it is important that teachers should present the classics with care and judgment, neither neglecting them for purely modern literature nor forcing them upon reluctant readers. Finally, we should clear our library shelves of uniform and unattractive sets of the classics published in cheap editions and printed in small type on poor paper, and replace them with modern, well-illustrated editions tempting to the youthful eye.

Naturally the pupils will be expected to read many other books in addition to those studied in the classroom. As evidence that they are reading acceptable books, they should be required to report briefly on their free reading. Reports should be informal oral comments expressing their sincere opinions. If written reports are required, they should be brief and meaningful. The pupils should be encouraged to keep a list of all books read and to submit this to the teacher from time to time.

4. Memorizing apt expressions
   - well-turned phrases and sentences
   - quotations for use
   - prose or verse passages
     - chosen by the pupils
     - suggested by the teacher
   - passages from the Bible

About one hundred lines chosen from both poetry and prose should be memorized in each grade. It is impossible to suggest suitable passages for each grade because of the wide diversity in taste and appreciation that exists even within a single class. The selections to be memorized should be chosen by the pupil. Teachers should not be disturbed to discover that some pupils will choose selections that, according to adult standards, are not good poetry, nor should they in their desire to improve the immature taste attempt to force an appreciation of standards for which the children are not ready. Such attempts are rarely successful and frequently they result in lessening or killing entirely the love of poetry they were designed to foster. As the pupils mature, their preferences change. As experience widens, tastes improve. The inferior tends to be discarded and the better preferred, but this is only true when taste is not forced and when literature of different kinds and quality has been sampled so that the pupils themselves can exercise their powers of choice.

The dramatic presentation of plays and choral reading provide purposes which the pupil readily understands and accepts for memorization.

Presumably poetry is memorized to be quoted. In the testing of memory work, emphasis should be placed upon understanding and appreciation as evidenced in the oral presentation.

A considerable body of opinion supports the memorization of fine poetry selected by the teacher. It is the view that this is an effective way of "storing the mind" with worthwhile literature and that many adults in moments of quiet reflection derive pleasure and satisfaction from the recollection of memory work

learned in their school days. Teachers who take this view can, no doubt, communicate their enthusiasm to the pupils and arouse a desire to memorize a selection of which the teacher is particularly fond. The unmotivated assignment of selections for memorization can do nothing but harm.

5. Choral reading
   - interpreting and enjoying rhythmic passages
   - encouraging the self-conscious adolescent

Some teachers will wish to pursue the practice of choral reading until the recitation becomes a polished and artistic oral exercise. Others will be satisfied with its more practical use as a pleasant aid to memorization. It can become an enjoyable group experience, but its use should not cause individual practice in oral reading and recitation to be neglected.

6. Collecting examples of choice prose and poetry
   - contemporary as well as earlier literature
   - illustrating other subjects, e.g., occupations, Canada and other lands, heroic endeavour

Oral Communication

1. Having something to say
2. Giving simple directions and explanations
3. Informal conversation
   - opening a conversation
     - being friendly
     - choosing a topic
   - keeping the ball rolling
   - being courteous
   - greeting newcomers to the group
   - making introductions
   - taking one's leave

Informal conversations will lead naturally to discussion and practice contributing to competence in a great variety of situations, such as extending congratulations or condolences, telephoning, apologizing without self-disparagement, conducting the formal interview.

4. Narration
   - relating personal experiences
     - anecdotes
     - stories that have been read
   - making enquiries and explanations
     - to ensure full understanding
     - to gain facility in questioning and answering

5. Discussion
   - recognizing essential matter
   - speaking to the point
   - participating freely

discussing problems of everyday living
seeing both sides of a question
conducting special enquiry periods by panel method, etc.
debating -- informal, formal

A good class discussion is more than casual talk. It deals with a subject within the range of the pupils' experience. It has a definite purpose which they accept as worthwhile for the group. It follows the accepted rules of courtesy and orderly procedure. It takes place in a setting which encourages all pupils to contribute to the common purpose with the confidence that relevant facts and sincere opinions will be respected although they may be refuted. A good discussion aims at bringing out evidence which provides a basis for making decisions or taking action, but it will be successful if the pupils deepen their understanding of the subject by exchanging their ideas. The teacher's part is that of a senior partner who leads the pupils to evaluate their own efforts and who has the responsibility of ensuring that the discussion has an evident pattern and a definite goal.

As the pupils mature, the classroom discussion may be used more and more effectively in bringing out diverse points of view, presenting problems, airing grievances, offering solutions, summarizing and evaluating, and determining group action. The benefits of this practice in discussion will be evident in all the activities of the school programme, and the responsibilities of the pupils in these activities should be extended from grade to grade. Each pupil should be led to recognize the value of his participation in discussion both to himself and to the class, and as the pupils progress through the Intermediate Division, they can be guided to take over from the teacher an increasing amount of the speaking involved in the daily lessons. "Teaching is the art of assisting discovery to take place." (Mark Van Doren)

6. Reading for others

expressing the author's purpose
  silent preparation
  understanding the point
  responding to the feeling
  grouping and emphasizing the words
  interpreting the music
making the best use of the voice
  regular instruction and practice in clear, natural enunciation
  using the lips and the tongue
  breathing and posture
  keeping the eye ahead of the voice
  correct pronunciation
using the voice recorder
  hearing ourselves as others hear us

Reading for others will contribute to the development of oral communication when purposeful to both the reader and the audience. Reading for others may also be used as an intermediate step towards addressing an audience.

In oral expression the teacher should stress the importance of clear articulation and enunciation, together with the basic principles of timing, phrasing, and natural inflection of the voice. Serious speech defects require the services of a specialist; the teacher's efforts to overcome them may do more harm than good. Injunctions to speak more loudly or clearly are of little value. The teacher's own good example, coupled with specific directions about moving the lips or sounding the endings of words, and an acceptance by the class of the importance of good speech, will accomplish much more. The frequent use of a voice recorder is a valuable aid in improving speech.

7. Assemblies

regularly held, in classroom or auditorium
organized and conducted by the pupils
subject to teachers' advice and approval
followed by class evaluation

Reading an announcement, a letter, a portion of the scriptures, or a prayer to the assembly will help to establish the confidence which is essential to platform speaking.

8. Dramatization

informal classroom dramatics
more formal presentations
- choosing a play or making a play
- assigning parts after tryouts
- discussing costume, scenery, properties
- assigning duties
- rehearsing
- making changes as necessary
- final rehearsal
- presentation to others

Dramatic production and acting in the classroom, the school auditorium, or the puppet theatre will give the pupils valuable training in many activities. Here they will find scope for their varying talents and interests. Cooperation, initiative, self-expression, growth of personality, and fuller appreciation of dramatic literature will all be fostered by the presentation of suitable plays capably and wisely directed. With encouragement pupils can write brief plays or scenes based upon their reading or experiences. They can share the direction, the making of properties and costumes, and the many other phases of dramatic production.

9. Extra-curricular activities
- organizing a club
- conducting a meeting
- observing conventions of procedure
- participating in classroom meetings
  - Junior Red Cross
  - house-league activities
- using these skills in community activities, church, clubs, athletic leagues

10. Speaking to an audience
    platform manners
    confidence
    careful preparation
    increasing demands through graded activities
    sincerity and enthusiasm
    naturalness of tone
    practice in introducing and thanking speakers

As a preparation for platform responsibilities, classroom practices in the art of introducing or thanking a speaker, welcoming or bidding adieu to a visitor, making a charitable or patriotic appeal will take on life and meaning for the pupils. Each pupil should be given as many opportunities as possible for this practice. The teacher and the pupils may discuss criteria for judging the content and delivery of public addresses and arrive at a reasonable standard for themselves. While deprecating the mere memorization of unoriginal material and emphasizing the importance of originality and spontaneity, teachers must recognize that refinements in the art of public speaking are highly mature developments. In the Intermediate Division the quality of the performance is secondary to the growth of the pupils' skill and confidence.

Written Communication

In helping pupils to improve the expression of their thought in writing the teacher should keep in view the following objectives:

(i) to encourage pupils to make their own observations and to record their own thoughts within a widening range of experience,
(ii) to stimulate them to explore and elaborate these ideas and to develop their own powers of thinking,
(iii) to enable them to convey to other people the results of their thinking as clearly and completely as possible.

Since the pupil's progress in oral expression contributes to his progress in writing, the teacher should regularly insist upon oral answers which are coherent and convey the thought completely. This is the readiest way of developing the power to think coherently and to frame a straightforward English sentence. Pupils should be asked to write on subjects of which they have some knowledge and on which they have the right to an opinion of their own. The teacher can find thought-provoking subjects for written work through discussions with the pupils or lead the pupils to find such subjects for themselves through planned activities. Pupils should be led to decide for themselves in advance the people for whom they are writing. The audience may be the writers themselves, the teachers, the class or the school, parents, friends, or the community. But the audience should be a real one within the capacity as well as the right of the pupil to address. Asking pupils to write without definite readers in mind, as if they were addressing a vacuum or the civilized world, encourages pretence and platitudes.

Pupils should be led to define clearly for themselves their purpose in writing. The purpose may be to tell a good story, to describe, to explain a simple process, to report an event, or to support an opinion, in order that the reader

may be entertained, informed, or convinced. Most pupils will be challenged to their best efforts if their writing is closely related to practical affairs and motivated by real situations, such as producing a school paper, obtaining a position, contributing to a project or a meeting. This is of real importance, for many teachers of English have at the back of their minds the text-book and the examination rather than the activities of practical life.

1. Extending general skills through
   - study of needs
   - pupil exercises based on
     - needs
     - interests (personal and group)
     - work in other subjects
     - outside experiences
   - growth in power to analyse and judge
   - praise for sincere effort, spontaneity
   - special and specific help for those limited in ability and background
   - self-improvement through revision and refinement

2. Organizing
   - determining purpose
   - planning the attack
   - locating and recording material
   - selecting pertinent material
   - arranging material
     - topic, main idea
     - contributing ideas
     - challenging opening
     - logical sequence
     - effective closing

3. Writing: narration, description, exposition
   - suggested by pictures and cartoons
     - pantomime
     - entertaining anecdotes or incidents
     - local happenings
   - based upon reading
   - derived from work in other subjects
   - adding a sequel to a story
   - making a similar story
     - different characters, plot, setting
   - completing a story
     - given the beginning, the middle, or the end
   - imaginative stories
   - conversations and dramatizations
   - announcements for bulletin board or school paper
   - descriptions
     - definite point of view
     - dominant impression
     - selection and arrangement of details
     - using the apt word

explanations
- types and uses
- planning for clarity
- introducing subject and getting attention
- explaining point by point and in logical and understandable fashion
- summing up and rounding off the explanation

records -- diary, journal, note
autobiography
summaries and simple précis

Most pupils entering the Intermediate Division tend to write a mixture of narrative and description and lean towards pure story telling. It is the task of the teacher in the Intermediate Division to take the pupil at whatever stage he may be and to advance and enlarge his skill in varied types of writing. This means a continuation, and sometimes a correction, of earlier practices accompanied by a gradual introduction of new and more mature assignments. For example, a purer type of description may now be encouraged and developed; accounts of assemblies, lectures, plays, or concerts will become more detailed and vivid; more assignments will require written answers, based on paragraphs, articles, chapters, or whole books, which develop naturally from the earlier stages of summarizing and outlining; records, journals, diaries, logs will become progressively more mature. But none of this will happen in a vacuum. It will happen only where there is intelligent appraisal of the pupils' abilities and needs, where there is thoughtful discrimination as to type and amount of work to be done, and where there is genuine motivation at the outset and warm satisfaction at the end.

4. Letter writing
   - the art of personal communication
   - friendly informal letters
     - as occasions arise
     - about real situations
     - basic letter conventions
       - parts
       - punctuation
       - capitals
       - spacing
       - addressing envelopes
     - news letters to family, friends, pen pals
     - good manners in letters (informal and formal)
       - invitations
       - thank-you letters
       - letters of appreciation
         - apology
         - acceptance
         - congratulation
         - sympathy
         - regret
     - sending messages on post cards
     - telegrams and night letters
     - business letters
     - applying for work
     - ordering articles

requesting information
correcting an error
making a claim or complaint
discussing a business venture
letters of instruction
a travel letter to family, friends, or strangers in other cities and countries

Letter writing is an art. The writer must have clearly in mind the purpose of his letter and try to attain it by putting himself in the place of the person for whom the letter is intended. Teachers must emphasize the message of the letter and help pupils to determine the proper mood and purpose. The mechanics of the letter should receive only a small portion of the teaching time. The various types of letters should not be taught in routine fashion but should be introduced as occasion arises, e.g., a letter of sympathy to a member of the class who is ill, a thank-you letter to the school board for providing a class treat.

5. Recording the minutes of a meeting
   - time
   - place
   - motions
   - business transacted

If the officers for organizations such as Junior Red Cross, hobby clubs, and assemblies are changed frequently, many pupils will have the opportunity to gain experience in executive duties. The purpose of this type of work is primarily growth and development of the pupil's ability to conduct a meeting and to discharge his duties properly in any executive capacity.

6. Making or contributing to a class paper or magazine
   - a joint enterprise
   - everyone given a chance at various duties
   - teacher supervision (not domination) to improve pupils' taste and judgment
   - general pupil contribution
     - story, news, poems, illustrations
   - emphasis on benefit to pupil through participation
   - a suggested plan
     - each pupil contributing a written page, article, cartoon, etc.
   - revisions by editorial staff with teacher help as needed
   - mimeographed where possible
   - assembled, covered, and bound by art staff
   - distributed by circulation staff at little or no cost

Thought, Structure, and Grammar

1. The sentence
   - as a unit of thought
   - classification as an aid to written expression according to
     - meaning -- assertive, interrogative, imperative, exclamatory
   - according to structure -- simple, compound, complex
   - parts of a sentence as an aid to clarity and variety

subject
predicate
modifying parts
adjective -- word, phrase, clause
adverb -- word, phrase, clause
completing parts -- object, completion
types of sentences
loose, periodic, balanced
special effect of each type
gaining effect through
unity
coherence
emphasis
variety
force -- diction, word order
oral and written parctice
to enable pupils to use sentences with clarity, correctness, and special effect

2. The paragraph
recognition of the paragraph as a unit of thought
unity-- one division a phase of a subject
order -- logical sequence of ideas
coherence -- interrelationship of ideas
the structure of a paragraph
topic sentence
development of idea -- details, contracts, comparison, examples
effective conclusion
the writing of paragraphs
models as a basis for study
oral preparation for written work
information derived from other subjects
summaries of information from reference books
simple exercises in précis writing
planning and writing compositions of more than one paragraph -- means of transition and reference

Pupils should be enabled to recognize and appreciate a good paragraph as a definite pattern for the expression of a unit of thought and also to write lucidly and effectively one or more paragraphs on topics suited to their stage of development.

3. Grammar

recognition and use of noun, pronoun, verb, adjective, adverb, preposition, conjunction, interjection
classification as an aid to clarity, accuracy, and vividness
nouns -- common, proper, abstract, concrete
pronouns -- personal, demonstrative, indefinite
conjunction -- co-ordinate, subordinate
verbs -- transitive, intransitive, copula
agreement of the verb with its subject

- phrases
  - adjective
  - adverb
  - verb
  - other types as need may arise
- clauses
  - principal
  - subordinate
    - adjective
    - adverb
    - noun
- the structure of sentences
  - simple and clausal analysis as an aid to the understanding and improvement of sentence structure
- verbs
  - agreement with subject
  - recognition and use of tense forms
    - present
    - past
    - future
    - sequence of tenses
  - mood
    - indicative
    - imperative
    - subjunctive (brief reference)
  - voice
    - active
    - passive
  - infinitives and participles
    - use to secure force and conciseness
  - special exercises in usage
    - correct use of commonly misused past tenses and perfect participles, e.g., saw, seen, did, done
    - distinction as the need arises between its, it's, their, there; to, too; etc.
    - irregular plurals of nouns in common use
    - formation and use of possessive forms in nouns
    - comparatives and superlatives in adjectives and adverbs
    - precision in the use of prepositions, e.g., in, into; on, upon; etc.

The study of grammar is a means of improving the expression of thought and provides standards for determining its correctness. It should, therefore, be functional in the sense that it is based upon the pupils' needs and is of practical value; its scope and emphasis are determined by the requirements of individual pupils as revealed in their speech and writing. It should be taught as an ordered description of current accepted practice in the use of our language. Terminology should not be emphasized for its own sake but should be used only as an aid to clarity and accuracy in speech and writing. Pupils should be led to discover the fundamental rules of grammar from carefully selected examples. The discovery of these rules should be closely followed by their application and by plenty of purposeful practice.

"In its right place, at the right time, and in right measure, instruction in grammar is not only a desirable but an essential part of the English course." (Ballard)

Spelling

attention to spelling in all written work
habitual use of dictionary
regular practice adjusted to individual needs
additional time devoted to word-study by good spellers
ample practice for weak spellers according to their needs
variety of techniques, such as
  careful pronunciation
  noting differences in words of similar form
  inducing a pride in good spelling
  keeping a personal list
encouragement of vocabulary growth
continued attention to the uses of capitals
regular use of the blackboard to familiarize pupils with
  new words which might be misspelled
special attention in context to commonly misspelled words:
  does, knows, off, there, too, write, asked, buy, coming,
  dropped, shining, stopped, sure, taking, their, quite,
  truly, woman, believe, busy, through, written, break,
  different, isn't, don't, quiet;
  threw, two, whole, whose, writing, all right, almost,
  beginning, children, led, forty, its, loose, lose, loving,
  together, until, across, business, can't, women, fourth,
  minute, piece, receive, easily, immediately;
  stretch, toward, certain, describe, hoping, already, library
  separate, speech, whether, won't, wouldn't, description,
  disappointed, finally, generally, government, grammar,
  similar, necessary, principal, probably, sincerely,
  definite, divide, lady's, ninth, eighth, twelfth;
  preferred, usually, ninety, quantity, interesting, athlete,
  prevent, captain, course, formerly, athletics, sandwich,
  intramural, studying, laboratory, choose, losing, laid,
  siege, weather, answered, didn't, doesn't, really, occurred,
  pleasant, accommodation. (Hatfield: An Experience Curriculum
  in English)

acceptance of variant spellings found in any standard dictionary

Instruction in the simple rules of spelling and functional practice in the spelling of words suited to the pupils' level of maturity and commonly used in their written work should be carried on methodically. Instruction in spelling must keep pace with reading and vocabulary development. Emphasis should be placed upon introducing and testing new words in context. Correct spelling can best be achieved by first understanding the word, and then seeing, saying, and writing it until it is mastered. The real test of the ability to spell a word is in its actual use in written work. Some pupils need very little help in spelling; most pupils need considerable help. For all pupils short lists of words well mastered are of greater help than long lists treated mechanically and spasmodically.

Handwriting

pride in good craftsmanship
care and attention in all work
legibility through
  careful formation of letters
  attention to margin
  spacing
  alignment
  uniformity of slant
importance of correct writing posture
gradual increase in speed without loss of legibility
individuality in style allowed but neatness and legibility required
regular writing periods for pupils requiring assistance drills to
  correct specific errors
  pupils excused when satisfactory standards reached and maintained

Responsibility for handwriting is shared by all teachers, but the teacher of English assumes the primary responsibility for the maintenance of good standards of neatness and legibility throughout successive grades. Needless to say, teachers should set a good example, especially in blackboard writing.

Text-Books

For pupils' text-books on the approved list, reference should be made to Circular 14, Text-Books Approved, and Recommended, and to subsequent announcements which may be made during the year by the Department. In addition to the books on this list, it is understood that several series of literature and language texts for Grades VII, VIII, IX, and X are in preparation.

For English literature in Grades IX and X, it is suggested that the course include at least one book from three or more of the following divisions: (i) a novel (ii) a Shakespeare play, a modern play, or a collection of one-act plays (iii) a collection of shorter poems -- chiefly narrative (iv) a collection of myths and legends.

REFERENCE BOOKS FOR TEACHERS

General

Balcon et al: English Language and Literature. Ryerson.
Ballard: Teaching and Testing English. Clarke, Irwin.
Craig: The Junior Speech Arts. Macmillan.
Haddow: On the Teaching of Poetry. Ryerson.
Hartog: Words in Action. Clarke, Irwin
Lewis: Poetry for You. Copp Clark.
Morris: Drama is Fun. Ryerson.
Pinto (Ed.): The Teaching of English in Schools. Macmillan.

Reading

Gray (Ed.): Classroom Techniques in Improving Reading. Gage.
Hicks: The Reading Chorus. Clarke, Irwin.
Smith: Books for Boys and Girls. Ryerson.
Teacher's Guide -- Life and Literature, Books I and II. Nelson.

Composition

Alstetter: We All Talk. Nelson.
Kenny: A New Course in English Composition. Clarke, Irwin.
Pocock: Pen and Ink. Dent.
Shaw: Writing and Rewriting. Musson.
Woolley, Scott, and Tressler: Handbook of Writing and Speaking. Copp Clark.

Usage

Annandale: Large Type Concise English Dictionary. Ryerson.
Freeman: Plain English. Dent.
Fowler: Modern English Usage. Oxford.
Fowler: The Concise Oxford Dictionary. Oxford.
Roget: Thesaurus. Longmans.
Thorndike: Century Senior Dictionary. Gage.
Webster's Dictionary of Synonyms and Antonyms. Allen.
Webster's Collegiate English Dictionary. Allen.

MATHEMATICS

GENERAL INTRODUCTION

The Role of Mathematics

The ability to compute accurately and to think clearly in terms of quantities, either specific or generalized, is becoming of increasing value in all phases of social and economic life. It was never more important that the teacher should appreciate the role of mathematics in modern civilization.

Relation to Pupil's Experience

If the pupil realizes the part which mathematics plays in his daily life, the subject becomes meaningful to him. Mathematics is challenging and interesting to the pupil who sees its importance in his home and in his community. The material presented, therefore, should be related as closely as possible to situations that are within the experience and comprehension of the pupil.

The Study of a System

While the ideal method is to develop concepts in mathematics from the personal experience of the pupil, it should be remembered that mathematics is the product of racial experience, the collective result of a large number of thinkers. Pupils in the Intermediate Division should begin to gain an appreciation of mathematics as a logical system by developing some of the underlying principles. The understanding of these principles and the mastery of the related skills require intellectual effort on the part of the pupil. It is the task of the teacher to create conditions which will make the pupil willing and eager to undergo this intellectual discipline because he feels it to be eminently worthwhile.

A Sense of Accomplishment

The value of confidence which comes from successful accomplishment as a result of the pupil's best effort should always be kept in mind. The pupil should be encouraged to aim at a high degree of accuracy in the fundamental operations. Success in mathematics is based on ability to think independently and logically, to express ideas clearly and concisely, and to set them down accurately and neatly. In the selecting and designing of exercises, however, the degree of difficulty should be adjusted to the mental maturity of the pupil so that he has a reasonable opportunity of being successful.

Remedial Teaching

At the beginning of the school term the teacher should not assume that his pupils are fully, or equally, competent in the work of the preceding grade. Standardized achievement tests are useful in indicating the pupil's level of accomplishment in comparison with what may be expected of the average pupil under normal conditions. The results of such tests, viewed in the light of the mental age of the pupil, will often indicate the kind of remedial teaching that is necessary. The teacher should not postpone this remedial work until the next term or until the next grade, but should begin it as soon as the need is revealed. Failure to do this will result in an accumulation of faulty habits, repetition of errors, improper techniques, and undesirable attitudes.

Problem Solving

The aim in solving problems should be to learn to use a general method of attack rather than to depend upon the memorization of type solutions. Success in problem solving results from individual initiative and logical procedure, both of which may be developed by training the pupil to adopt some such plan as the following:

1. Read the question carefully, making sure that you understand every part of it.

2. Decide what you are asked to find.

3. Re-read the question to see what facts you are told. If you can make a diagram to illustrate the question, mark these facts on it.

4. Decide how you can use the given facts to help you find what is asked for.

5. Examine your answer to see whether it is reasonable, and then verify it by using it in the original statement.

The importance of training students to use clear, succinct, but complete solutions of problems cannot be overemphasized. Business requires the submission of calculations to support the answers obtained. These calculations should be shown on the same sheet as the solution and not in discarded pieces of paper or on the back pages of a notebook.

The following is an example of an acceptable solution with its accompanying calculations:

27¾ yd. at 1.32 = 36.63	1.32	.98	.7093
35 " at .98 = 34.30	27¾	35	8
70.93	99	490	5.6744
Sales tax 8% 5.67	924	294	
$76.60	264	34.30	
	36.63		

In the foregoing solution it may be noted that to find 8% of $70.93, 1% of the amount was used and then multiplied by 8. This is standard practice in commercial work.

Frequently pupils are unable to solve written mathematical problems owing to lack of reading ability rather than to any lack of mathematical knowledge. A recognition of this weakness should suggest the necessity for special instruction in reading mathematical problems.

Difficulty in solving problems may be due to an emotional disturbance of some kind. Such emotional blocking may arise from the sense of frustration experienced by the pupil when he is required to attempt problems above the level of his maturity or to apply principles which have not been thoroughly taught by numerous simple examples.

On the other hand, the pupil's initiative and latent creative ability will be stimulated if he is challenged from time to time by being given the responsibility for studying a topic or working on a problem without the teacher's assistance. If the assignments are suited to the varying abilities of the members of the class, each one may be enabled to feel on occasion the keen satisfaction which comes from an awakened sense of achievement.

Conservation

It is important that pupils develop an intelligent appreciation of the need for conserving our natural resources of forest, farm, and water supply. The teacher's attention is called to the Report of the Select Committee on Conservation, 1950, Chapters 35 and 36, "Conservation and Education" and "Conservation in the Schools," as well as to the Report of the Ontario Royal Commission on Forestry, 1947, Chapter 14, in which the relation of conservation to education is discussed. Problems in mathematics may be related to the various phases of conservation -- forests, soil, and water supply. Teachers of mathematics should cooperate with teachers of other subjects in coordinating the work on conservation. An appropriate topic might be the calculation of the cost of shrubs, flowers, seeds, and paint for the improvement of the school grounds. Suitable problems should also be used to impress upon the pupils the economic losses suffered through soil erosion, floods, and forest fires.

Objectives

The preceding remarks illustrate some of the following objectives of the work in the Intermediate Division.

1. A thorough understanding of the fundamental operations and increasing power to apply them with accuracy and facility.

2. A continuous development of the capacity for mental calculation.

3. Ability to apply mathematical knowledge to the solution of problems which are meaningful to the pupil and of social value.

4. Self-reliance which comes from willingness to attack and ability to solve problems.

5. Acquisition of the habit of judging the reasonableness of an answer and of checking its accuracy.

6. The drawing of valid conclusions from experiments in simple space relationships.

7. An understanding of the generalization of number and of the application of algebra to simple problems.

8. An appreciation of the wide application of mathematics and of its influence in the advancement of civilization.

9. A sense of personal responsibility for accuracy, neatness, and precision, with the consequent feeling of satisfaction resulting from work well done.

10. The discovery and development of individual mathematical abilities, aptitudes, and interests so that pupils will desire to continue the study of the subject.

GRADE SEVEN (from 1951 Curriculum I:1 Revised, Pages 145-151)

I. Skill in Fundamental Operations

Preliminary survey of the class-group to determine the achievement levels of the individual pupil.
Diagnostic testing and remedial treatment as needed.
Frequent, regular, and well-motivated drill involving the fundamental operations in the work of Grades I to VI.
Drill practices on new work of Grade VII, following presentation of each topic, together with periodic cumulative review throughout the year.

Suggestions

1. Teachers are reminded of the value of frequent, varied, and carefully planned oral practice in all phases of the work. The resourceful teacher will be ready to improvise practice material and problems suited to the needs of the pupils, supplementing the exercises provided in the text.

2. Teachers should endeavour to impress the pupils with the necessity of striving for a high degree of accuracy in the fundamental operations. To this end the complexity of the exercises should be carefully adjusted to the pupils' abilities.

3. If properly motivated, drill practice can be made an enjoyable part of the mathematics period. Care must be taken that incorrect methods are not perpetuated by unsupervised practice and that mere repetition is not depended upon to produce the desired improvement.

II. Common Fractions

Meaning and use
Review of addition and subtraction
Multiplication
    fraction by a whole number
    whole number by a fraction
    fraction by a fraction
    mixed number by a fraction
    mixed number by a mixed number
Simplification of fractions through division of numerator and denominator by a common factor
Practical problems involving fractions

Suggestions

1. It is essential that the work in fractional numbers be introduced through numerous simple concrete examples. An aid in making clear the meaning of a fraction at this stage might be to write 2/5 as 2 fifths.

2. It is important also that operations with fractions should be based on techniques which are clearly understood and which are as closely as possible related to the fundamental properties of a fraction. In short, the understanding of numerous specific concrete illustrations should always precede the learning of a mechanical technique.

3. The review work in fractions should stress the fact that the value of a fraction is unchanged by multiplying or dividing numerator and denominator by the same number. This principle should then be used as generally as possible as the basis for teaching the procedure to be followed in the fundamental operations with fractional numbers.

4. The student should not be permitted
   (i) to bring mixed numbers to improper fractions for addition or subtraction, or for multiplication by a whole number,
   (ii) to reduce fractions to lower terms if calculations are thereby made more difficult,
   e.g., $\frac{84}{100}$ of 42 = $\frac{21}{25}$ of 42.

III. Decimal Fractions

Meaning and use
Review of addition and subtraction
Multiplication
- decimal by a whole number
- decimal by 10, 100, 1000, etc.
- whole number by a decimal
- decimal by a decimal
- treatment of zeros in decimal answers
- placing decimal point by inspection when multiplying by 10, 100, 1000 -- .1, .01, .001
- practical problems involving decimals
- the common metric units of length (metre, cm., mm.)

Suggestions

1. The mechanical rule for the placing of the decimal point in the product of numbers involving decimal fractions should be postponed until repeated simple examples based on a step-by-step development prepare the pupil for this technique:

   e.g., $3.1 \times 4 = 3\frac{1}{10} \times 4 = 12\frac{4}{10} = 12.4$

   $2.4 \times 3.6 = \frac{24}{10} \times \frac{36}{10} = \frac{864}{100} = 8.64$

2. Examples should probably be confined to numbers containing not more than 3 places of decimals.

3. The teacher should keep in mind that in certain cases an operation may be more readily performed with the corresponding common fraction than with the decimal:

   e.g., $24 \times .25 = 24 \times \frac{1}{4} = 6$

Hence the pupil should be given practice in converting decimal fractions into their common fraction equivalents:

e.g., $.25 = \frac{25}{100} = \frac{1}{4}$

$.375 = \frac{375}{1000} = \frac{3}{8}$

IV. Percentage

Meaning and use
Equivalent forms: 5 per centum, 5 percent

$5\%, \frac{5}{100}, .05$

Meaning of 100%: the whole quantity, $\frac{100}{100}$, 1
Expressing simple percents as decimal fractions
Expressing decimal fractions as percents
Expressing a percent as an equivalent common fraction
Expressing halves, fourths, fifths, and tenths as percents
Finding a percent of a number
(i) by expressing the percent as a decimal fraction and multiplying
(ii) by using the common fraction equivalent of the percentage and multiplying
Expressing one number as a percentage of another
Simple practical problems involving percentage

Suggestions

1. Pupils should be given practice in using both decimal and common fraction equivalents in the problems involving percentage so as to develop judgment in choosing the more suitable form.

   Thus $\frac{1}{6}$ is to be preferred to .166 or .167, but .04 is usually to be preferred to $\frac{1}{25}$

2. The work on common fractions, decimal fractions, and percentage should result in the pupils being thoroughly familiar with such equivalent forms as the following:

   $\frac{1}{2} = .5 = 50\%$

   $\frac{1}{4} = .25 = 25\%$, and its multiples

   $\frac{1}{8} = .125 = 12\frac{1}{2}\%$, and its multiples

   $\frac{1}{5} = .2 = 20\%$, and its multiples

   $\frac{1}{10} = .1 = 10\%$, and its multiples

3. Memorization should result from and not precede repeated use.

V. Practical Problems Arising in the Ordinary Life of Pupils in School, Home and Community

Games, cooking, woodworking, sewing.
Keeping cash accounts of newspaper sales, care of chickens or live stock, together with the use of bills and receipt forms
Budget for boys and girls
    allowance, holiday money, club funds
Managing Junior Red Cross and other similar funds
Travel by car, bus, train
Conserving the resources of the home, the farm, the local community, and the country at large
Improving the school grounds
Earning money by selling on commission
Taking advantage of discounts
    in paying bills -- gas, water, electric
    in paying cash for purchases
    in bargain sales

Suggestions

It is extremely important that the pupil should be prevented from acquiring an attitude of frustration toward problem solving. In order to avoid this, the teacher should constantly keep in mind the following considerations:

1. While it is true that a problem may naturally be used to introduce the discussion of a topic, yet care should be taken that the fundamental principles involved are thoroughly understood, through the use of a series of simple numerical illustrations, before any extensive problem assignment is given.

2. Thorough oral discussion of illustrative problems together with the development of oral solutions should precede written work.

3. The teacher should never be in a hurry to introduce a formula or a mechanical technique. With junior pupils particularly, the procedure should be to emphasize the fundamental principle involved by applying it to numerous concrete examples and to delay the introduction of any generalizing formula or mechanical method until the pupil has become thoroughly familiar with the underlying idea. This is desirable for two reasons:

    (i) in order that the pupil may not solve the problem in a purely mechanical fashion, and
    (ii) in order that, should the pupil forget the formula, he may still be able to solve the problem from basic principles.

    The formula $i = prt$ is a case in point.

4. A major factor in the pupil's ability to solve problems is his skill in reading. Too often the teacher assumes that the pupil comprehends the problem when actually he may fail to grasp its significance. Not only, therefore, should the pupil be taught to read and re-read each question with concentration, but also the teacher should frequently determine by suitable oral discussion whether the pupil really understands the language of the question and the nature of the problem posed.

5. Pupils should be systematically trained in a desirable mental approach to the problem situation. They should be constantly reminded to ask themselves, "What am I to find?", and other similar questions which will guide their procedure.

6. It is important that the pupil should learn to estimate his answer in advance of the solution, to check his final answer for reasonableness, and then to verify it for accuracy.

7. A pupil's training in neatness and orderliness of work will reveal itself in the manner in which he sets down his written solutions. Here he should have the benefit of careful training and constant supervision from the beginning. Statements should be as clear and concise as possible, and any necessary mechanical work should be shown adjacent to the written solution.

VI. Measurement

Review of linear and square measures
Finding the area of a rectangle, measuring its diagonal
Meaning of volume
    the cubic inch, the cubic foot, the cubic yard
Finding volumes of rectangular solids and contents of rectangular containers
Straight lines
    vertical, horizontal, oblique, perpendicular
Measuring accurately with ruler graduated to sixteenths of an inch and to millimetres
Drawing lines to scale
Interpreting pictographs, bar graphs, and line graphs
Making simple bar graphs, line graphs, and scale drawings

Suggestions

1. Each classroom should possess at least the following items of equipment:
    a bulletin board on which pupils' recent work in mathematics, or current topics of mathematical significance may be displayed
    a section of cross-ruled blackboard or, perhaps better, a cross-ruled chart attached to a spring roller
    yard stick, metre rule, and several straight-edges
    a set of models of the common solids, particularly a subdivided cubic foot
    pint, quart, gallon, peck, and bushel measures

2. Each pupil should have a ruler, graduated in sixteenths of an inch and in millimetres. A supply of squared paper, ruled ten lines to the inch, should be available.

3. In connection with exercises in accurate measurement, pupils should be given practice in estimating the measures of objects and familiar distances, and in using the unit of measurement suited to the occasion. They should also be introduced in an elementary way to the idea of approximation in the expression of measured quantities.

4. The introduction and use of formulas in measurement should be avoided until the pupil is thoroughly familiar with the fundamental concepts on which the formulas are based. The development should always be graphical and objective and the applications simple and meaningful.

5. Line graphs should be developed directly from bar graphs. A line graph should be considered as the upper boundary of a series of vertical bars.

6. At this stage the right angle might be thought of simply as a square corner, an idea already familiar to the pupil.

GRADE EIGHT (from 1951 Curriculum I:1 Revised, Pages 151-157)

1. Skill in Fundamental Operations

Preliminary survey of the class-group to determine the achievement levels of the individual pupil
Diagnostic testing and remedial treatment as needed
Frequent, regular, and well-motivated drill involving the fundamental operations in the work of Grades I to VII
Drill practices on the new work of Grade VIII, following presentation of each topic, together with periodic cumulative review throughout the year

Suggestions

1. Teachers are reminded of the value of frequent, varied, and carefully planned oral practice in all phases of the work. The resourceful teacher will be ready to improvise practice material and problems suited to the needs of the pupils, supplementing the exercises provided in their texts.

2. Teachers should endeavour to impress the pupils with the necessity of striving for a high degree of accuracy in the fundamental operations. To this end the complexity of the exercises should be carefully adjusted to the pupils' abilities.

3. If properly motivated, drill practice can be made an enjoyable part of the mathematics period. Care must be taken that incorrect methods are not perpetuated by unsupervised practice and that mere repetition is not depended upon to produce the desired improvement.

4. Practice in short division should be a feature of the review of the fundamental operations. By the end of Grade VIII, the transition from long to short division for single digit divisors should be completed.

II. Common Fractions

Review of addition, subtraction, multiplication
Division
    whole number by a fraction with numerator 1
    whole number by any fraction
    fraction by a whole number
    fraction by a fraction
    similar operations with mixed numbers

Review of the simplification of fractions through division of numerator and denominator by a common factor
Multiplication by a proper fraction -- decreased result
Multiplication by an improper fraction -- increased result
Division by a proper fraction -- increased result
Division by an improper fraction -- decreased result
Practical problems involving fractions

Suggestions

1. It is essential that the work in fractional numbers be introduced through numerous simple concrete examples and should be based on the following fundamental principles:
   (i) The fraction $\frac{2}{5}$ means 2 fifths;
   (ii) The value of a fraction remains the same when the numerator and denominator are multiplied or divided by the same factor;
   (iii) In dealing with the addition and subtraction of fractions, the pupil should be encouraged to proceed, as he gains experience, from Statement I, below to Statement II.

   Statement I

   $$\frac{3}{4}+\frac{2}{5}-\frac{5}{6}=\frac{45}{60}+\frac{24}{60}-\frac{50}{60}=\frac{69}{60}-\frac{50}{60}=\frac{19}{60}$$

   Statement II

   $$\frac{3}{4}+\frac{2}{5}-\frac{5}{6}=\frac{45+24-50}{60}=\frac{19}{60}$$

2. While it is possible that some of the pupils must depend almost entirely on memorization in the application of the rule for division of fractions, it is suggested that most of them may be helped to see a reason for this rule, and also for those dealing with the other operations, in the following approach which emphasizes the basic properties of fractions.

   $$\frac{1}{2}+\frac{1}{4}=\frac{2}{4}+\frac{1}{4}=2 \text{ fourths} + 1 \text{ fourth} = 3 \text{ fourths} = \frac{3}{4}$$

   $$\frac{1}{2}\times\frac{1}{4}=\frac{1}{4} \text{ of } \frac{1}{2}=\frac{1}{4} \text{ of } \frac{4}{8}=\frac{1}{4} \text{ of } 4 \text{ eighths} = 1 \text{ eighth} = \frac{1}{8}$$

   $$\frac{1}{2}\div\frac{1}{4}=\frac{2}{4}\div\frac{1}{4}=2 \text{ fourths} \div 1 \text{ fourth} = 2$$

3. Pupils should be trained to observe accuracy in statement of equality, using the following form

   $$\frac{2}{3} \text{ of } \frac{3}{5}+\frac{1}{4}=\left(\frac{2}{3} \text{ of } \frac{3}{5}\right)+\frac{1}{4}=\frac{2}{5}+\frac{1}{4}=\text{etc.}$$

   and avoiding such errors as

   $$\frac{2}{3} \text{ of } \frac{3}{5}+\frac{1}{4}=\frac{2}{3} \text{ of } \frac{3}{5}=\frac{2}{5}+\frac{1}{4}=\text{etc.}$$

III. Decimal Fractions

Review

meaning of decimals as common fractions with denominators which are powers of 10
place value
story of invention of decimal fractions
addition, subtraction, multiplication

Division

change of common fractions to decimals (division of numerator by denominator)
division by 1,000, 100, 10, .1, .01, etc.
effect of multiplication and division by a number less than one
practical problems involving decimals

Suggestions

1. The teaching of decimals should be based on the fundamental properties of fractions. For example, the rule for making the divisor a whole number in the division of decimals should be derived from the knowledge of the fact that multiplying numerator and denominator by the same number (in this case a multiple of 10) does not alter the value of the fraction.

IV. Percentage

Review and extension of the work of Grade VII, including

(a) finding a "percent" of a number
  (i) by expressing the percent as a decimal fraction and multiplying
  (ii) for simple percentages such as 50%, 25%, etc. by using the common fractional equivalent of the percentage and multiplying.
  (iii) by using the 1% method. The 1% method has more frequent application and should be thoroughly learned. For example, if it is required to find 8% of 74.60, it is quite simple to note that 1% of 74.60 is 0.7460 and consequently, 8% of 74.60 is $0.7460 \times 8 = 5.9680$

(b) expressing one number as a percentage of another

Special treatment of more difficult percents

100% and "percents" greater than 100%
1%....9% -- correct translation to decimal fractions
fractional "percents" in common use -- ½%, ¼%, etc.
"percents" such as 2½%, 3¼%.

Finding a number when a "percent" of it is known

Practical problems involving percentage

Suggestions

1. The principles of problem solving outlined in the Grade VII Course are equally applicable to the work of Grade VIII and should be carefully studied by the teacher.

V. Practical Problems Arising in the Home, School, and Community Life of the Pupils

Managing Junior Red Cross and similar funds
Estimating cost of building school rink, improving school grounds
Budgeting for Hallowe'en party, Christmas concert
Building stage for puppet show
Laying out a garden, finding cost of seed
Conducting a paper collection and disposing of papers
Keeping records of athletic events
Laying out a softball diamond
Managing a business venture
    ticket sale, selling newspapers, care of chickens or livestock
Making a map of the local community to scale
Finding cost of clothes
Planting a reforestation area
Arranging transportation for an excursion

Suggestions

1. Only simple and direct problems within the range of the pupils' experience should be presented at this stage. These problems should illustrate the various ways in which simple calculations involving the fundamental operations, fractions, decimals, and percentage are used in everyday activities.

VI. Measurement

Problems based on topics of Grade VII
The circle
    radius, diameter, circumference
    discovery by experiment of relationships
        circumference is $3\frac{1}{7}$ or 3.14 times diameter
        area is $3\frac{1}{7}$ or 3.14 times square of radius.

The angle
    defined by rotation of line
    measured by amount of rotation
    degree as a unit of measurement
    drawing and measurement of angles with ruler and protractor
    right, acute, and obtuse angles
Interpreting and making simple circle graphs
The magnetic compass
Use of ruler, compasses, and protractor
    in design, in drawing plans, in reading of topographic maps, in solving problems, etc.
    further practice in linear measurements involving the millimetre, centimetre, and metre
    knowledge of the kilometre

Triangles

definition and construction of equilateral, isosceles, scalene, right-angled triangles
discovery of relationships holding among angles in these triangles
experimental derivation of area

Suggestions

1. A reasonable degree of accuracy and neatness should be required. Measurements within one-sixteenth of an inch, one millimetre, and one degree should be expected.

2. Attention should be given to the development of the idea of approximation which was introduced in Grade VII. Continual practice in estimating the measures of objects, distances, and angles will help to familiarize the pupil with the units involved. Comparison of the answers which are obtained by the individual pupils of the class is one useful method of developing the idea of the degree of accuracy possible under any given conditions.

3. Throughout the work in measurement, emphasis should be on the experimental approach. This applies, for example, in the discovery of the approximate relationship between the circumference of a circle and its diameter and in the checking of the formula connecting the area with the radius; it should govern the introduction to the work on the metric system where it is important that the pupil actually use the metric units in measurement and not simply learn a table of measures; it should also be the basis for teaching the relationship connecting the angles of any triangle in the section on experimental geometry.

4. Each pupil should have a pair of compasses and a protractor.

GRADE NINE

General Observations

1. Since the course in Mathematics is obligatory for all Grade IX pupils, it must meet the requirements of those who may shortly leave school to enter industry or business, those who have begun or who may at the end of the year transfer to a vocational course, and those who, proceeding through the various grades of the general course, finally attempt the study of the Algebra, Geometry, and Trigonometry of Grade XIII.
   For this reason, the following outline includes sections on Experimental Geometry, Measurement, Commercial Arithmetic, and Algebra, each of which contains those topics which have been thought essential to these various groups in Grade IX. Where the class group is reasonably homogeneous and its future programme is known, the course may be modified to suit its needs by varying the time allotted to each section and with it the emphasis and depth of treatment of the different topics. In any case, the teacher should endeavour to provide an enrichment of the course for the abler students through the suggested supplementary topics and more difficult examples.

2. Although it has been thought desirable to outline the course under the foregoing sections, it is important that the teacher take advantage of every opportunity to correlate as fully as possible the various phases of any

one topic. In this way the pupil will gradually come to realize that mathematics constitutes one main area of human knowledge and that the branches of Arithmetic, Algebra, and Geometry are merely different aspects of the same subject.

3. While it is hoped that each teacher will give serious thought to the most advantageous manner of organizing the year's work, it may not be out of place to suggest, in general terms, one possible arrangement.
Rather than beginning with an extensive review of the fundamental operations involving integers and common and decimal fractions and then proceeding to the other arithmetical topics in regular order, it is suggested that the year's work might begin with three periods a week in Experimental Geometry and two periods in Measurement, followed in due course by three periods a week in Algebra and two in commercial Arithmetic. Finally would come any necessary adjustments for finishing any particular section and for conducting a comprehensive review at the end of the year.
Under this programme the practice in the fundamental skills would be spread throughout the year and would be obtained not only by frequent systematic oral and written drill but also by the use of numerous arithmetical examples in the introduction to algebraic topics and in the application of geometric concepts.
The necessary practice in the fundamental operations should be made a regular feature of the mathematics lesson. Ordinarily it would occupy the first few minutes of the period. It should not, however, be haphazard or impromptu, but should consciously be aimed at correcting the weaknesses discovered through periodic diagnostic tests on definite aspects of the work. All pupils should participate in oral drill, but not all need take part in all the written tests. It should be remembered that accuracy and speed in the fundamental operations can be maintained only by regular practice and testing. This should be followed by diagnosis of errors and specific treatment. Those who have no need of remedial practice may be assigned other work.

4. The importance of the oral approach to mathematical teaching should constantly be kept in mind. New topics or new principles are frequently best introduced through a combination of the oral and written presentation. Their development should then proceed through numerous oral examples, followed by assigned written work at the blackboard or desks. Such a procedure will not only save valuable time but also enable the teacher better to determine the success of his presentation of the topic.
This should not be taken to imply that all new topics should be introduced by the teacher in a formal developmental fashion. On the contrary, the teacher should assign to the pupils a new topic or a new project for study or experiment at home or in the classroom at increasingly frequent intervals as they proceed through the grades. Only in this way will they develop initiative and ability in obtaining new ideas from the printed word, a development which must occur if they are to have any considerable success in furthering their education once they leave school.

5. The teacher of mathematics should assume his share of the responsibility for the quality of the pupils' oral and written English. The subject presents a unique opportunity for training in clear, precise statement and in neat, orderly written work. In particular the teacher should make sure that the pupil has mastered the meaning and the spelling of the terms used in the mathematics classes.

I. Experimental Geometry

Brief review of Experimental Geometry of Grade VIII, taken with ruler, protractor, etc.

Parallel lines
- considered as lines in the same plane running in the same direction, and never meeting
- related to equal corresponding angles
- constructed with the aid of protractor
- developed into experimental study of properties of parallelogram

The Pythagorean relation
- experimental establishment
- application to practical problems

Congruency of triangles
- experimental study of the cases sss, sas, saa
- recognition of triangle as stable unit of construction
- contrast with quadrilateral
- applications to indirect measurement of heights and distances

Similarity of triangles
- experimental study based on parallel lines
- application to measurement of heights and distances using scale drawings; correlation with map-reading
- significance of digits in reported measurements

Three-dimensional drawing
- correlated with Shop Work, if available
- scale drawing of elevations and plans
- three-view drawings

Supplementary topic
- experimental study, with formal proofs to be left to Grade X, of properties of triangles such as
  - the bisectors of the angles are concurrent
  - the right bisectors of the sides are concurrent
  - the altitudes, etc., of inscribed and circumscribed circles
  - the medians, centroid, centre of weight of a cardboard triangle

Suggestions

1. It is important that the ideas of approximation and degree of accuracy in measurement which were introduced in Grade VII and extended in Grade VIII should be further developed in this grade.

2. The extent to which the aims of the experimental work are realized will be revealed in the pupils' ability to make practical application of the results of this work to problems within their experience.

II. Algebra

Introduction to algebraic symbolism
- The generalized number
- its presence in formulas
- evaluation of expressions by substitution of known values
- terms, powers, etc., made meaningful by numerical and geometric illustrations

Directed numbers
- use of signs to signify concepts of opposite direction or quality
- illustrations by loss and gain, thermometer readings, etc.
- graphical representation along a straight line

Addition and subtraction
- combining terms with like or opposite signs by sensing the idea of loss and gain, etc.
- developing rule for subtraction
- exercises involving expressions of 3 terms each, or less
- indication of addition and subtraction by signs of operation

Equations
- simple equations of first degree in one unknown
- meaning of the term "root of an equation"
- solution by means of axioms
- verification of solutions
- rule of transposition developed from numerous concrete illustrations
- integral, fractional, and decimal coefficients
- the simple equation applied to the solution of practical problems

Formulas
- changing verbal statements into formulas and vice versa
- consideration of formulas as equations
- solution for one variable when others have given values
- changing the subject of a formula
- construction of tables from formulas

Multiplication and division
- operations with numbers having numerical and literal coefficients
- rule of signs for directed numbers
- index laws for positive integral indices
- applications to monomials
- product of a binomial or trinomial by a monomial
- common factor of simple expressions
- product of two binomials
- square of a binomial
- square root by the formal method -- algebraic and arithmetical examples

Supplementary topics
- factoring trinomials
- factoring the square of a binomial and the difference of two squares

Suggestions

1. The various rules referred to in the foregoing topics should always be preceded by numerous concrete examples. From these, under the guidance of the teacher, the pupil should arrive at the rule as summarizing the results of his work.

2. It is important that pupils early establish the habits of verification of results and of accuracy and good form in algebraic statements.

3. The teacher is reminded of the interest attaching to historical and biographical references and to suitable illustrations of graphs, formulas, etc., from current literature.

III. Arithmetic

Fundamental skills
- maintenance and extension of facility in oral and written computation with whole numbers, fractions, decimals, and percentages, together with necessary remedial work
- factoring to obtain square and cube roots

Measurement
- review of units of linear, square, cubic, and liquid measure, and of weight, as the need arises in the solution of problems
- review of circumference of circle and of area of rectangle, triangle, and circle
- understanding of the terms arc, chord, sector, tangent, etc.
- area of parallelogram, trapezoid, sector of circle, cylinder
- volume of rectangular solid, including lumber in board feet
- practical applications of the foregoing
- significance of digits in numbers obtained by measurement and in numbers obtained in calculation from measurements
- rounding off of decimal fractions and computation with approximate numbers
- supplementary topics
- surface and volume of prism, pyramid, cone, and sphere

Graphs
- review of circle graphs taken in Grade VIII
- construction of circle graphs from given data
- review and extension of line graphs (see suggestion 3 below) of formulas such as $C = \pi d$, $A = \pi r^2$, etc.

Commercial arithmetic
- problems related to buying and selling
  - trade and cash discount
  - mark-up of goods
  - profit and loss
  - commission
- problems related to banking
  - simple interest
  - promissory notes
  - instalment payments

problems related to property
- taxes
- fire and casualty insurance
- mortgages
- interest on mortgages

problems related to investments
- stocks and bonds
- life insurance
- compound interest

Suggestions

1. The teacher should refer to the suggestions regarding problem solving contained in the General Introduction.

2. In dealing with commercial arithmetic in this grade, the teacher should endeavour to see, first of all, that the pupils understand the meanings of the terms, and become familiar with the procedures commonly employed in everyday business transactions. Stress should then be laid upon facility in the solution of simple direct problems. Complicated examples should be deferred to later courses in Commercial Arithmetic.

   Thus, in the topic of compound interest, the pupil should be able to compute the interest on a given sum for two or three years and should also be able to use a table of amounts. He should not be expected to deal with problems involving present values

3. Suitable material for the making of line graphs may be found in various aspects of conservation, such as:
   - hydro electric power development in recent years
   - depletion of forest wealth through fire losses and indiscriminate cutting
   - river levels during flood periods
   - decreasing crop yields through unscientific farming
   - gasoline consumption at increasing car speeds
   - braking distances at various speeds

4. Throughout this grade the social aspect of the mathematical topics is of prime importance. Consequently, the teacher should make every endeavour to relate the class discussion and the problems to be solved to the everyday experience of the pupil. Municipal taxation, for example, need not remain a matter of definitions and type problems. If the pupil is brought to see that the various services which he and his parents enjoy -- roads, police and fire protection, garbage removal, snow cleaning and so on, and in particular, his own schooling -- are a charge upon the whole community, and if he comes to realize that his own parents either directly in their annual tax payments or indirectly in their monthly rent help to pay for these services, then the actual mill rate in his municipality and the assessment on his home will have real meaning. Similar considerations apply to the other topics of this section.

GRADE TEN (from 1951 Curriculum I:1 Revised, Pages 165-168)

General Observations

1. Mathematics in this grade becomes an optional subject. To the extent that other choices are available, the pupils who choose Mathematics should bring to to its study some aptitude for and some interest in the subject.

2. Since, however, these pupils will ordinarily have diverse objectives, there arises in this grade the need for alternative courses in Mathematics in so far as limitations of enrolment, accommodations, and teaching power make such parallel courses practicable. Subject to these limitations, provision should be made for the following groups:

   (a) those pupils who have college or professional aspirations and intend to continue the study of mathematics into Grade XIII. The requirements of this group are obvious -- a good grounding in elementary Algebra and Theoretical Geometry, preparatory to further work in these subjects in the later grades.

   (b) those pupils who hope to complete Grade XII but intend then to enter business or industry. These pupils need a more practical course, stressing commercial arithmetic or shop mathematics, and correlated with their commercial or shop option.

   (c) those pupils, usually approaching 16 years of age, who do not expect to attend school beyond Grade X, if indeed to complete that grade. In the limited time available, an attempt must be made to give this group certain basic mathematical knowledge and skills and also, if possible, some appreciation of mathematical discipline.

3. It is obvious that not all secondary schools are able to offer separate and distinct courses to suit the above groups. The Grade X enrolment will, in certain cases, be too small to make three or even two class groups feasible. In such a case the teacher has the difficult but not impossible task of so organizing his work and adapting his teaching procedure that the needs of each group will be cared for.

   In other schools it may be advisable to combine groups (b) and (c). This should present no particular problem. In the larger high schools and in vocational schools it may be possible to offer different courses to all three groups.

4. It should be emphasized once more that Curriculum Committees have the responsibility for working out the details of the mathematics courses best suited to the varying needs of the pupils in the schools under their jurisdiction.

5. The outlines of courses I, II, and III which follow are presented for the assistance and general guidance of the local authorities. They are intended particularly for group (a) and group (b) above. For the pupils of group (c), it is suggested that local authorities choose the portions of courses II and III best suited to their more practical interests and more immediate needs.

Course I -- Algebra and Geometry

The objective of this course is to review and extend the Algebra begun in Grade IX and to make a reasonable start in Theoretical Geometry -- in other words to prepare the pupil for the programme in Mathematics of Grades XI, XII, and XIII of the General Course as outlined in Circulars S.12 and 13.

Geometry

A brief review of the mathematical terms and procedure used in the Experimental Geometry of Grade IX. The review of the mathematical facts discovered in that course should be incorporated in the Grade X and later courses as they develop.

Propositions 1 to 19 and 23, 24 of Book I. (Propositions 20 and 21 may be taken as deductions; proposition 22 may be accepted as read; proofs for propositions 5 to 10 should be accompanied by practice in accurate construction with straight-edge and compasses.)

Suggestions

1. There should be emphasis on the analysis of deductions and on the development of facility in the logical statement of proof. To this end, a discussion of critical thinking, the nature of proof and the application of its fundamental principles to everyday problems should precede and accompany its use in formal mathematical reasoning.

2. The formal solution of construction problems may be taken as a supplementary topic.

Algebra

The Algebra of Grade IX should be reviewed and extended to include the topics outlined in Circular S.12 - namely:

review of the Algebra of Grade IX
type products and simple factoring
applications of factoring
equations with brackets and fractions
long multiplication, short and long division
equations of the first degree and word problems with one and two unknowns
coordinate graphs
furthering factoring and applications

Course II -- Commercial Mathematics

This course is intended to suit the needs of those pupils who do not desire to prepare themselves for the mathematics of Grade XIII but who wish further mathematical training in preparation for business life. These pupils intend to obtain a Secondary School Graduation Diploma in either the General or the Commercial Course; they may be taking meanwhile a Commercial Option or the full Commercial Course. Their Grade X programme in mathematics should be based, in general, on the outline suggested in S.12, modified in the light of the Grade IX course which they have completed, and varied in detail to suit local requirements and to prepare them for such courses in mathematics as may be available in later grades.

Course III -- Industrial Mathematics

This course is intended to suit the needs of those pupils who do not desire to prepare themselves for the mathematics of Grade XIII but who wish further mathematical training in preparation for industrial life. These pupils intend to obtain a Secondary School Graduation Diploma in either the General or the Industrial Course; they may be taking meanwhile a Shop Option or the full Industrial Course. Their Grade X programme in mathematics should be based, in general, on the outline suggested in S.12, modified in the light of the Grade IX course which they have completed, and varied in detail to suit the particular shop courses which they are taking and to prepare them for such courses in mathematics as may be available in later grades.

ART

Aims

1. To raise the standard of aesthetic taste.
2. To assist the pupil to develop his capacities to meet his needs.
3. To assist the pupil to become a useful and cooperative member of his social group.

Nature of the Art Programme

Art includes the use of the emotions and the intellect. In producing art forms the pupil is required to present his emotional and intellectual reactions to experiences in his life. Art is, therefore, a personal expression and depends upon the pupil himself. Since art is the expression of the pupil's reaction to life, it leaves no room for copying nor for the undue intrusion of adult thought. It must be remembered that the end product of this art programme is not the production of art objects, but rather the development of the properly educated pupil both as an individual and as a member of his social group.

Design

Design is not a separate division of the art programme. Pupils develop a feeling for design through practice, and not by the memorization of rules nor the execution of prolonged exercises. However, pupils should have controlled experience with elements of design, including: line, mass, space, light, shade, colour, texture. The control of this experience is one of the functions of the teacher of Art.

The study of these elements will be derived from the activities currently engaging the pupils. They will learn concepts of unity, variety, centre of interest, balance, rhythm, volume, shape related to function, and suitability of materials. Non-objective art is important in focusing attention upon design.

History of Art and Picture Observation

A formal isolated study of the history of art and of famous masterpieces is not required in these grades. Outstanding examples of work by professional artists both traditional and contemporary must not be ignored, however. Excellent material may easily be obtained from the National Gallery of Canada, Ottawa, the Art Gallery of Toronto, and from many current magazines, including 'Canadian Art.'

Professional work should be observed in conjunction with the art activities engaging the pupil at the moment. For example, should the pupil be dealing with social themes, his attention might be drawn to an artist such Daumier. Should he be dealing with line, he might observe some of the drawings of draughtsmen such as Picasso. Should he be confronted with problems of pattern, he might be directed to the works of such painters as Tom Thomson or Emily Carr.

It must be kept in mind that pictures collected and observed will never be used for purposes of copying, but that they will act as a constant inspiration for creative endeavour.

Evaluation for Pupils' Reports

Evaluation of progress should be based upon the ideas and emotions expressed by the pupil rather than upon neatness and technical quality.

The pupil who appears to be doing his best according to his level of maturity in the various aspects of his art programme should be considered satisfactory.

Formal examinations in art are not recommended, but a simple system of grading may be employed. Experimental work designed to develop a system of grading is being carried on at the present time.

Organization of the Art Programme

The Intermediate Art Programme is divided into two sections:

I. Picture-making
II. Optional activities

Picture-making will be taught each year and should be allotted approximately one-half of the prescribed time for art during the academic year.

Optional activities are sixteen in number. From these, three or four activities should be selected each school year. Care should be taken to vary the optional activities from year to year.

I. Picture-Making Programme

Recording Life Around Us
Community, home, school, and play

Still Life (to receive more emphasis in higher grades)
Children must be permitted to make their own arrangements of objects and then use their imagination to alter the arrangements on paper in order to create a more significant composition. However, some children with scientific minds will insist upon drawing with exactness, and this they should be permitted to do. If nature specimens are utilized in still life studies, the same freedom of expression should be allowed.

Life Drawing (all grades)
Life drawing should be related to other art activities.
Life drawing should be taught so that the pupil may gain self-confidence in his general picture-making.
The pupil should have freedom to re-arrange the drawing of posed figures to produce more significant design.
Both deliberate drawing from posed models and quick sketches of moving models should be made.

Non-Objective
The nature of non-objective painting should be thoroughly discussed.
The work of professional non-objective painters should be studied.
Non-objective painting should be included in the programme for those pupils who show special aptitude for it.

Materials for Picture Making

Media
- tempera paint
- charcoal
- chalk
- india ink
- oil paint (expensive but effective)

Brushes
- hog bristle (few)
- sable (many), No.6

Papers
- off-white papers preferred with most media in most cases
- minimum size 12" x 18"

Types of paper
- bogus
- sugar
- construction
- cream manilla
- wrapping
- newsprint
- craft
- cartridge

Special Techniques in Picture-Making

Montage using textured materials
- Mixed media, for example:
  - wax crayon with india ink and thinned tempera paint
  - montage and drawing media

II. Optional Activities

Linoleum Cutting
- The making of pictures, greeting cards, book plates, tickets, menu covers.
- The use of linoleum cuts for textile printing.
- Single or multiple blocks.

Weaving
- Weaving of scarves, belts, drapes, rugs, and other textiles.
- A study should be made of good hand weaving and of manufactured textiles.

Whittling and Carving
- Carving of non-objective forms, abstract carving in low relief, and natural forms with due regard for the medium.
- Some study should be made of Canadian wood-carving, including that of the West Coast Indians and of the French Canadians.
- Local woods such as cedar fence rails should be used if suitable.

Marionette and Puppet Making

Production of plays and stage settings with themes based upon original scripts or upon especially selected themes.

Production of plays will include the making of puppets or marionettes, costume designing, the building of the stage, arrangement of lighting, decor, stage management, manipulation of characters, and selection of suitable background music.

Paper Sculpture

Manipulation of paper into non-objective and abstract forms in two or three dimensions.

Making of masks, heads, figures, and settings.

Leather Work

Making of book marks, key cases, bill folds, purses.

Studying Design in Daily Life

A careful study of items of design in daily living, including: automobiles, aeroplanes, furniture and its arrangement, clothing, electrical fixtures, kitchen utensils, pottery and china, show windows, public buildings, advertising, magazines, books, contemporary home architecture.

Some attempt should be made by the pupils to design some practical objects with a view to their function and the material employed.

Silk Screen Printing

The printing of drapes, tablecloths, textiles for dresses, skirts, and blouses.

Using one or more colours.

Poster Making

Making of posters when the need arises.

Study of lettering styles and lay-out.

The use of cut paper in poster making and special techniques, including lettering with lettering pens, felt brushes, spatter work, or air brush.

Stage Craft

Designing of settings, costumes.

Study of lighting and make-up.

Production of a play.

Model Building

Making model houses, churches, schools, and other buildings which may later be grouped to form model communities.

Designing of room interiors and stage settings.

A study of good architectural forms.

Stencilling on Paper and Textiles

Making of book covers, tablecloths, textiles for dresses, skirts, and blouses.

Some patterns may be improved by free brush work after stencilling.

Book Making

Making of booklets, pamphlets, albums.
Designing covers, re-binding old books.

Work in Ceramics

The modelling of free forms, bowls, dishes, forms based upon living figures.
Firing and glazing.
A study should be made of good ceramic work.

Advanced Drawing

Drawing from the living model, still life, and landscape.
Media will include conté crayon, charcoal, pencil, fountain pen and ink, chalks, india ink, and mixed media
The work done is to meet the need of those who require additional skill in drawing. The photographic representation of objects is not necessarily required.

Metal Work

Making of low relief plaques from thin metal, costume jewellery, bowls, trays, and book-ends.

General Equipment

1. Drawing boards -- 18" x 24", poplar or cedar plywood, ½", 5/8", or 3/4" thick, or 1" solid pine or basswood.
2. T-squares -- about a dozen for lettering and poster work.
3. Adequate storage space.
4. Display boards for classrooms and halls made from building board, plywood, or cork.
5. Water supply. Where running water is provided a sink is desirable.
6. Table space. Flat top tables large enough to seat six pupils, or individual art tables with adjustable tops are desirable.

   Where art classes are conducted in standard classrooms with fixed desks, working surfaces for large sheets of paper may be obtained by the use of: tables placed at the back of the room,
   bulletin boards,
   blackboards by taping paper directly to the surface,
   tables hinged to walls below blackboards.
7. Work-bench with vise and carpenter's tools.
8. Muffin tins for mixing tempera paint -- 6 or 8 compartments to a tin.

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